



**BOWSER  
MORNER®**

COMMITTED TO EXCELLENCE  
SINCE 1911

4518 Taylorsville Road  
P.O. Box 51  
Dayton, OH 45401-0051  
937-236-8805  
937-233-2016 FAX  
www.bowser-morner.com

August 18, 2014

Via email only

Steven Renninger  
renninger.steven@epa.gov  
US EPA – Region 5, Superfund Division  
Emergency Response Section #1  
26 West Martin Luther Drive  
Cincinnati, OH 45268

Re: Report No. 161803-0814-178, 1-Year  
Proficiency Sampling Report; Valley  
Asphalt Site (Moraine, Ohio/South  
Dayton Dump & Landfill) Unilateral  
Administrative Order for Removal  
Activities, Dated March 21, 2013

Dear Project Representatives:

Bowser Morner, Inc. is submitting the enclosed 1-Year Proficiency Sampling Report for the Valley Asphalt Site (South Dayton Dump & Landfill) in Moraine, Montgomery County, Ohio.

Sub-slab, indoor air and outdoor air samples were collected. Each sample was analyzed for TO-15 parameters. Results of the testing show VOC levels below the available ODH screening levels and/or other applicable screening levels.

These results indicate that the SSDS system installed in Building 4 continues to mitigate vapor intrusion.

If you have questions, please contact me at (937) 236-8805, ext. 340.

Respectfully submitted,

BOWSER-MORNER, INC.

Katherine H. Beach, R.E.M.

Attachments  
KHB/ccs

cc: Dan Crago, Valley Asphalt – electronic copy via email; Dan.Crago@jrjnet.com  
Craig Ousley, Valley Asphalt – electronic copy via email; Craig.Ousley@jrjnet.com  
Leslie Patterson, EPA – electronic copy via email: patterson.leslie@epa.gov  
Lauren Foster, TetraTech - electronic copy via email: Lauren.foster@tetrattech.com  
Maddie Smith, OEPA/SWDO – electronic copy via email; Madelyn.Smith@epa.state.oh.us

**ANALYTICAL SCIENCES • GEO-ENVIRONMENTAL SERVICES • CONSTRUCTION SERVICES**

DAYTON • TOLEDO • CINCINNATI • LEXINGTON • SPRINGFIELD • BIRMINGHAM

1-Year Proficiency Sampling Report; Valley Asphalt Site  
(Moraine, Ohio/South Dayton Dump & Landfill) Unilateral  
Administrative Order for Removal Activities, Dated March 21, 2013

For

Valley Asphalt  
11641 Mosteller Road  
Cincinnati, OH 45241

Report No. 161803-0814-178

August 18, 2014

## 1.0 INTRODUCTION

In response to the Unilateral Administrative Order (UAO) for Removal Actions issued to Valley Asphalt (Valley) by the United States Environmental Protection Agency (EPA) on March 21, 2013 and on behalf of Valley Asphalt, Bowser Morner, Inc. performed vapor intrusion (VI) testing required by the VI Mitigation Work Plan (“Work Plan”) submitted on May 30 and subsequently revised on July 7, 2013.

The primary focus of this report is to provide the results of the 1-Year Proficiency Sampling. A summary of the results of previous testing (conducted after installation of the sub-slab depressurization system [SSDS]) is also enclosed.

This report is organized into the following sections:

- **Section 1, Introduction** – Provides a brief description of the objective and scope of the work summarized in this report.
- **Section 2, Site Background** – Discusses the Site description and history.
- **Section 3, Sampling and Field Screening Activities** – Discusses Site sampling and field screening methods used during this work.
- **Section 4, Analytical Methods** – Discusses analytical methods used during this work.
- **Section 5, Analytical Results** – Discusses analytical results for samples collected during this work.
- **Section 6, Conclusions** – Summarizes the analytical results and presents conclusions based on these findings. Figures and tables are presented after the conclusions section.

## 2.0 SITE BACKGROUND

The Valley Asphalt site (Site) is located at 1901 Dryden Road in Moraine, Montgomery County, Ohio. The Site sits atop the northern part of the South Dayton Dump and Landfill site, which is undergoing a concurrent Removal Action.

Originally, seven buildings on Site were identified and included in the Work Plan. Six of those structures have been demolished, thus eliminating an exposure risk of vapor intrusion. The remaining building, Building 4, still stands, is used by Valley and is the subject of this proficiency testing event.

During VI investigations conducted in 2012 by CRA and EPA, TCE was observed in four different sub-slab samples collected in Building 4. Each sample exceeded the ODH TCE sub-slab screening level. TCE was not observed in the indoor air sample collected in Building 4 above the ODH TCE indoor air screening level. Building 4 is a two-story building used as the control center for the Site's asphalt plant. The basement, approximately 5-feet below grade, consists of a poured foundation and poured walls. The sub-slab samples were collected from the basement floor. A pre-fabricated building sits atop of the basement and is the control center for the asphalt operations.

Due to the risk to human health to indoor air exposure to VOCs and the risk of explosive conditions due to explosive gas, EPA ordered Valley Asphalt to undertake removal activities to mitigate these risks. Valley Asphalt submitted the required Work Plan for the removal activities on May 30 (revised on July 7, 2013) and has steadily performed the work outlined therein, as follows:

- A sub-slab depressurization system (SSDS) was installed in the basement of Building 4 on July 10, 2013 to mitigate sub-slab vapors that appear to be migrating up from the underlying South Dayton Dump and Landfill.
- Initial proficiency sampling was conducted in July and August of 2013. The initial proficiency sampling showed no exceedances of the ODH



screening levels and that the mitigation system (SSDS) was working to remove volatiles from beneath the slab of Building 4.

- Additional proficiency testing was conducted at 180-days; no exceedances of the ODH screening levels were detected. Inspection showed that the mitigation system (SSDS) continued to work to remove volatiles from beneath the slab of Building 4.

The following information summarizes the 1-Year Proficiency Testing required by the Work Plan.

### **3.0 SAMPLING AND FIELD SCREENING ACTIVITIES**

All sampling was performed in accordance with the Work Plan submitted to EPA on May 30 and revised on July 7, 2013. All deviations from the Work Plan will be noted in the applicable section(s) below.

#### **3.1 BUILDING SURVEY**

In accordance with Section 3.3 of the Work Plan, a building survey was conducted in Building 4 on July 7, 2014 and documented on a Form 1: Building Physical Survey Questionnaire. The surveys did not identify any significant, negative issues.

#### **3.2 RADIUS OF INFLUENCE TESTING**

In accordance with Sections 4.3 and 4.5 of the Work Plan, Radius of Influence testing was performed on July 7, 2014 prior to any sampling activities. Radius of Influence was confirmed at the sub-slab probe (SSP4-1) with a vacuum of -0.040 inches w.c.

#### **3.3 FIELD SCREENING FOR METHANE**

Field screening for methane inside the building was performed in accordance with sections 3.4, 3.4.1 and 3.5 of the Work Plan. The concentration of methane in the ambient air at SSP4-1 was measured using field instrumentation (LandTec Gem) at the

beginning and end of sampling on July 7, 2014. Methane was measured to be 00.0 percent each time.

On July 7, 2014 and prior to sampling the sub-slab air, SSP4-1 was purged in accordance with Section 3.4 of the Work Plan. An additional bag of air was collected and screened for methane using the LandTec Gem. The post-purge methane concentration was 00.0 percent

No leak testing of SSP4-1 was performed, as SSP4-1 was confirmed to be intact during the 30-day proficiency testing. A sub-slab soil vapor sample was collected into a bag for field methane screening after collection of the 8-hour sample and tested for the presence of VOCs and methane; no VOCs and methane were indicated by the screening equipment (LandTec Gem and ppbRAE).

### **3.4 1-YEAR PROFICIENCY TESTING**

#### **3.5.1 SUB-SLAB PROFICIENCY SAMPLING**

In accordance with Sections 3.1, 3.2.1, 3.2.1.4, 3.4, 3.4.1 and 3.5 of the Work Plan, an 8-hour sample was collected from SSP4-1 on July 7, 2014. This sample was collected over a period of 8 hours and 2 minutes to meet the SUMMA can sample collection requirements listed in Section 3.1 and Table 3 of the Work Plan. The sample was analyzed for TO-15 parameters.

The primary COC, Trichloroethylene (TCE), was detected at a concentration of 0.21 ppbv ( $1.4 \text{ ug/m}^3$ ) in the sub-slab sample. Several “new” volatiles in the TO-15 list were detected including carbon disulfide, isopropylbenzene, MTBE, Styrene and 1,3,5-trimethylbenzene. Other previously-detected volatiles were detected again, the highest of which was ethanol at 220 ppbv ( $410 \text{ ug/m}^3$ ). All volatiles detected were below the ODH screening levels.

#### **3.5.2 INDOOR AIR TESTING**

The 1-Year Proficiency Sample was collected on July 7, 2014 in accordance with Sections 3.1, 3.2.1, 3.2.1.1 and 3.3 of the Work Plan. This sample was collected over a

period of 6 hours and 50 minutes to meet the SUMMA can sample collection requirements listed in Section 3.1 and Table 3 of the Work Plan. The sample was analyzed for TO-15 parameters.

The primary COC (TCE) was, for the first time, detected in this sample. TCE was detected at a concentration of 1.0 ppbv ( $5.4 \text{ ug/m}^3$ ) in the indoor air sample. The ODH screening level for TCE is 2 ppb ( $10 \text{ ug/m}^3$ ); this level was not exceeded by the indoor air sample. One other volatile in the TO-15 list that was not detected in the previous sampling event (henceforth noted as a “new” volatile) was detected during this proficiency testing (cis-1,2-dichloroethene) at levels well below the ODH screening level. Other volatiles, detected in the previous sampling event, were detected during this proficiency testing, the highest of which, again, was ethanol at 230 ppbv ( $430 \text{ ug/m}^3$ ).

### 3.5.3 OUTDOOR AIR TESTING

The 1-Year Proficiency Sample of outdoor air was collected on July 7 and 8, 2014. Collection of this sample deviated from the Section 3.1 and Table 3 of the Work Plan, as the sample canister vacuum failed to meet either the time or the vacuum requirements. After 8 hours and 45 minutes of testing on July 7, 2014, the sampling valve was closed due to imminent rain. It was noted to EPA and Tetra Tech that the vacuum change did not appear to be at a rate that would meet the requirements in Section 3.1 and Table 3 of the Work Plan. Consensus was reached to obtain the laboratory’s opinion on whether valid data could be generated from the sample under the current conditions.

As the laboratory had not responded by the beginning of operations on July 8, the SUMMA canister was set up again for sample collection. After an additional 42 minutes, the laboratory called and stated that they believed that reliable data could be generated with the sample that had been collected under these circumstances; sampling was halted at this point. In all, the sample was collected over a period of 9 hours and 27 minutes.

Trichloroethylene was not detected in the outdoor air sample. Three “new” volatiles (n-hexane, methylene chloride and m&p xylene) were identified in this sample. Several other volatiles in the TO-15 list were detected in these samples, with acetone

being the highest at 7.5 ppbv ( $18 \mu\text{g}/\text{m}^3$ ). There are no applicable ODH screening levels for outdoor air samples.

#### 4.0 ANALYTICAL METHODS

Bowser Morner, Inc. collected a total of one sub-slab, one indoor air and one outdoor air sample from Building 4 for analysis by a contract laboratory. ESC Lab Sciences (Mt. Juliet, Tennessee) was used to analyze the samples. These samples were analyzed for volatile organic compounds using EPA TO-15. The laboratory data results are enclosed as Appendix A of this report.

#### 5.0 ANALYTICAL RESULTS

Tables 1 through 6 summarize the analytical results, as follows:

Table 1	1-Year Proficiency Sampling: Sub-Slab
Table 2	180-Day Proficiency Sampling: Indoor Air
Table 3	180-Day Proficiency Sampling: Outdoor Air
Table 4	Summary of Three Proficiency Sampling Events: Sub-Slab
Table 5	Summary of Three Proficiency Sampling Events: Indoor Air
Table 6	Summary of Three Proficiency Sampling Events: Outdoor Air

Analytical results for each sample are provided in these tables and may be found in Appendix A. The analytical results presented in the Sub-Slab and Indoor Air tables are compared to the ODH screening and/or other regulatory levels. No ODH screening and/or other regulatory levels were exceeded by any of the media tested (sub-slab, indoor air and outdoor air).

The primary COC for this project, trichloroethylene (TCE), was identified for the first time in the indoor air sample during the 1-year proficiency testing with a concentration of 1 ppb ( $5.4 \mu\text{g}/\text{m}^3$ ). The ODH screening level for TCE in indoor air is 2 ppb ( $10 \mu\text{g}/\text{m}^3$ ). No TCE had been detected in the indoor air samples collected prior to the SSDS and during post-SSDS installation 1-month and 180-day sampling events. TCE

was also identified in the Sub-Slab sample, but at a concentration less than that detected during the 180-day proficiency testing event. The Sub-Slab TCE concentration (1.3 ppb and 7  $\mu\text{g}/\text{m}^3$ ) was below the ODH screening level (20 ppb and 100  $\mu\text{g}/\text{m}^3$ ). TCE was not detected in the outdoor air sample.

While other volatiles were identified during this sampling event, none exceeded available ODH screening levels.

The validated laboratory analytical results for the samples will be submitted with the Final Report summarizing the actions taken to comply with the UAO.

## **6.0 CONCLUSIONS**

1-Year proficiency samples were collected from Building 4 in July 2014. Sub-slab, indoor air and outdoor air samples were collected. Each sample was analyzed by TO-15 methods. No samples exceeded available ODH and/or other regulatory levels.

TCE was detected in the indoor air and sub-slab samples collected from Building 4. TCE had not been detected in the indoor air during the previous Valley-directed sampling of the Building 4. TCE had been detected in the Sub-Slab sample collected at the 180-day proficiency testing. Because Valley no longer uses the basement of Building 4 as the central storage location for raw materials, parts and supplies, it is possible that less traffic occurred in the basement, leading to stagnant air in which VOCs may have accumulated.

The proficiency sampling shows that the mitigation system (SSDS) continues to remove volatiles from beneath the slab of Building 4 on the Valley site.

## APPENDIX A

**TABLE 1**  
**SUB-SLAB SAMPLING RESULTS, VALLEY ASPHALT**

Sample Event: 1-Year Proficiency Testing

Matrix: AIR  
Sub-Slab  
Sample ID: SS-161803- 070714-KB-41  
Lab Sample ID:

TO-15  
Collect Date: 7/7/2014  
Collect Time: 17:22:00

Parameter	Units	Value	ODH Screening (ppb)	Units	Value	ODH Screening (µg/m <sup>3</sup> )
Acetone	ppb	15	-	µg/m3	36	-
Allyl chloride	ppb	<0.200	-	µg/m3	<0.626	-
Benzene	ppb	0.73	20	µg/m3	2.3	40
Benzyl Chloride	ppb	<0.200	-	µg/m3	<1.04	-
Bromodichloromethane	ppb	<0.200	-	µg/m3	<1.34	-
Bromoform	ppb	<0.600	-	µg/m3	<6.21	-
Bromomethane	ppb	<0.200	-	µg/m3	<0.776	-
Carbon disulfide	ppb	13	-	µg/m3	40	-
Carbon tetrachloride	ppb	<0.200	-	µg/m3	<1.26	-
Chlorobenzene	ppb	<0.200	-	µg/m3	<0.924	-
Chloroethane	ppb	<0.200	-	µg/m3	<0.528	-
Chloroform	ppb	1.5	800	µg/m3	7.3	4000
Chloromethane	ppb	<0.200	-	µg/m3	<0.413	-
Dibromochloromethane	ppb	<0.200	-	µg/m3	<1.70	-
1,2-Dibromoethane	ppb	<0.200	-	µg/m3	<1.54	-
1,2-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
1,3-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
1,4-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
1,2-Dichloroethane	ppb	<0.200	-	µg/m3	<0.810	-
1,1-Dichloroethane	ppb	<0.200	160	µg/m3	<0.802	630
1,1-Dichloroethene	ppb	<0.200	-	µg/m3	<0.793	-
cis-1,2-Dichloroethene	ppb	<0.200	370	µg/m3	<0.793	1500
trans-1,2-Dichloroethene	ppb	<0.200	-	µg/m3	<0.793	-
1,2-Dichloropropane	ppb	<0.200	-	µg/m3	<0.924	-
cis-1,3-Dichloropropene	ppb	<0.200	-	µg/m3	<0.908	-
trans-1,3-Dichloropropene	ppb	<0.200	-	µg/m3	<0.908	-
1,4-Dioxane	ppb	0.42	-	µg/m3	1.5	-
Ethanol	ppb	220	-	µg/m3	410	-
Ethylbenzene	ppb	54	2500	µg/m3	230	13000
Trichlorofluoromethane	ppb	0.3	-	µg/m3	1.7	-
Dichlorodifluoromethane	ppb	0.34	-	µg/m3	1.7	-
Hexachloro-1,3-butadiene	ppb	<0.630	-	µg/m3	<6.73	-
n-Hexane	ppb	0.23	-	µg/m3	0.81	-
Isopropylbenzene	ppb	0.93	-	µg/m3	4.6	-
Methylene Chloride	ppb	0.31	-	µg/m3	1.1	-
Methyl Butyl Ketone	ppb	<1.25	-	µg/m3	<5.11	-
2-Butanone (MEK)	ppb	3.5	-	µg/m3	10	-
4-Methyl-2-pentanone (MIBK)	ppb	<1.25	-	µg/m3	<5.12	-
Methyl methacrylate	ppb	<0.200	-	µg/m3	<0.819	-
MTBE	ppb	0.22	-	µg/m3	0.79	-
Styrene	ppb	13	-	µg/m3	55	-
1,1,2,2-Tetrachloroethane	ppb	<0.200	-	µg/m3	<1.37	-
Tetrachloroethylene	ppb	0.21	250	µg/m3	1.4	1700
Toluene	ppb	58	-	µg/m3	220	-
1,2,4-Trichlorobenzene	ppb	<0.630	-	µg/m3	<4.66	-
1,1,1-Trichloroethane	ppb	<0.200	-	µg/m3	<1.09	-
1,1,2-Trichloroethane	ppb	<0.200	-	µg/m3	<1.09	-
Trichloroethylene	ppb	1.3	20	µg/m3	7	100
Vinyl acetate	ppb	<0.200	-	µg/m3	<0.704	-
Vinyl chloride	ppb	<0.200	20	µg/m3	<0.511	40
m&p-Xylene	ppb	40	2000	µg/m3	170	8000
o-Xylene	ppb	13	2000	µg/m3	56	8000
1,2,4-Trimethylbenzene	ppb	5.2	-	µg/m3	26	-
1,3,5-Trimethylbenzene	ppb	1.4	-	µg/m3	6.9	-
1,4-Bromofluorobenzene	% Rec.	96			96	

**Notes**

**Bolded** values indicate target analyte at or above a detectable level.

**TABLE 2**  
**INDOOR AIR SAMPLING RESULTS, VALLEY ASPHALT**

Sample Event: **1-Yr Proficiency Testing**  
 Matrix: AIR  
 Source: Indoor Air  
 Sample ID: IA-161803- 070714-KB-41

Method: TO-15  
 Collect Date: 7/7/2014  
 Collect Time: 4:11 PM

**Results**

Method	Parameter	Units	Value	ODH Screening (ppb)	Units	Value	ODH Screening (µg/m3)
TO-15	Acetone	ppb	7.1	-	µg/m3	17	-
TO-15	Allyl chloride	ppb	<0.200	-	µg/m3	<0.626	-
TO-15	Benzene	ppb	<0.200	2	µg/m3	<0.639	4
TO-15	Benzyl Chloride	ppb	<0.200	-	µg/m3	<1.04	-
TO-15	Bromodichloromethane	ppb	<0.200	-	µg/m3	<1.34	-
TO-15	Bromoform	ppb	<0.600	-	µg/m3	<6.21	-
TO-15	Bromomethane	ppb	<0.200	-	µg/m3	<0.776	-
TO-15	Carbon disulfide	ppb	<0.200	-	µg/m3	<0.622	-
TO-15	Carbon tetrachloride	ppb	<0.200	-	µg/m3	<1.26	-
TO-15	Chlorobenzene	ppb	<0.200	-	µg/m3	<0.924	-
TO-15	Chloroethane	ppb	<0.200	-	µg/m3	<0.528	-
TO-15	Chloroform	ppb	<0.200	80	µg/m3	<0.973	400
TO-15	Chloromethane	ppb	0.54	-	µg/m3	1.1	-
TO-15	Dibromochloromethane	ppb	<0.200	-	µg/m3	<1.70	-
TO-15	1,2-Dibromoethane	ppb	<0.200	-	µg/m3	<1.54	-
TO-15	1,2-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
TO-15	1,3-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
TO-15	1,4-Dichlorobenzene	ppb	<0.200	-	µg/m3	<1.20	-
TO-15	1,2-Dichloroethane	ppb	<0.200	-	µg/m3	<0.810	-
TO-15	1,1-Dichloroethane	ppb	<0.200	16	µg/m3	<0.802	63
TO-15	1,1-Dichloroethene	ppb	<0.200	-	µg/m3	<0.793	-
TO-15	cis-1,2-Dichloroethene	ppb	0.24	37	µg/m3	0.95	150
TO-15	trans-1,2-Dichloroethene	ppb	<0.200	-	µg/m3	<0.793	-
TO-15	1,2-Dichloropropane	ppb	<0.200	-	µg/m3	<0.924	-
TO-15	cis-1,3-Dichloropropene	ppb	<0.200	-	µg/m3	<0.908	-
TO-15	trans-1,3-Dichloropropene	ppb	<0.200	-	µg/m3	<0.908	-
TO-15	1,4-Dioxane	ppb	<0.200	-	µg/m3	<0.721	-
TO-15	Ethanol	ppb	230	-	µg/m3	430	-
TO-15	Ethylbenzene	ppb	<0.200	250	µg/m3	<0.867	1300
TO-15	Trichlorofluoromethane	ppb	0.27	-	µg/m3	1.5	-
TO-15	Dichlorodifluoromethane	ppb	0.3	-	µg/m3	1.5	-
TO-15	Hexachloro-1,3-butadiene	ppb	<0.630	-	µg/m3	<6.73	-
TO-15	n-Hexane	ppb	0.38	-	µg/m3	1.3	-
TO-15	Isopropylbenzene	ppb	<0.200	-	µg/m3	<0.983	-
TO-15	Methylene Chloride	ppb	0.36	-	µg/m3	1.3	-
TO-15	Methyl Butyl Ketone	ppb	<1.25	-	µg/m3	<5.11	-
TO-15	2-Butanone (MEK)	ppb	<1.25	-	µg/m3	<3.69	-
TO-15	4-Methyl-2-pentanone (MIBK)	ppb	<1.25	-	µg/m3	<5.12	-
TO-15	Methyl methacrylate	ppb	<0.200	-	µg/m3	<0.819	-
TO-15	MTBE	ppb	<0.200	-	µg/m3	<0.721	-
TO-15	Styrene	ppb	<0.200	-	µg/m3	<0.851	-
TO-15	1,1,2,2-Tetrachloroethane	ppb	<0.200	-	µg/m3	<1.37	-
TO-15	Tetrachloroethylene	ppb	<0.200	25	µg/m3	<1.36	170
TO-15	Toluene	ppb	0.6	-	µg/m3	2.3	-
TO-15	1,2,4-Trichlorobenzene	ppb	<0.630	-	µg/m3	<4.66	-
TO-15	1,1,1-Trichloroethane	ppb	<0.200	-	µg/m3	<1.09	-
TO-15	1,1,2-Trichloroethane	ppb	<0.200	-	µg/m3	<1.09	-
TO-15	Trichloroethylene	ppb	1	2	µg/m3	5.4	10
TO-15	Vinyl acetate	ppb	<0.200	-	µg/m3	<0.704	-
TO-15	Vinyl chloride	ppb	<0.200	2	µg/m3	<0.511	4
TO-15	m&p-Xylene	ppb	0.52	200	µg/m3	2.3	800
TO-15	o-Xylene	ppb	0.2	16	µg/m3	0.87	63
TO-15	1,2,4-Trimethylbenzene	ppb	0.25	-	µg/m3	1.2	-
TO-15	1,3,5-Trimethylbenzene	ppb	<0.200	-	µg/m3	<0.982	-
TO-15	1,4-Bromofluorobenzene	% Rec.	94			94	

**Notes**

**Bolded** values indicate target analyte at or above a detectable level.



**TABLE 3**  
**OUTDOOR AIR SAMPLING RESULTS, VALLEY ASPHALT**

Sample Event:	<u>1-Year</u>	<u>Proficiency Testing</u>
Matrix:	AIR	
Source:	Outdoor Air	
Sample ID:	OA-161803-	070714-KB-41
Method	TO-15	
Collect Date	7/8/2014	
Collect Time:	8:49	

**Results**

Method	Parameter	Units	Value	Units	Value
TO-15	Acetone	ppb	<b>7.5</b>	µg/m3	<b>18</b>
TO-15	Allyl chloride	ppb	<0.200	µg/m3	<0.626
TO-15	Benzene	ppb	<0.200	µg/m3	<0.639
TO-15	Benzyl Chloride	ppb	<0.200	µg/m3	<1.04
TO-15	Bromodichloromethane	ppb	<0.200	µg/m3	<1.34
TO-15	Bromoform	ppb	<0.600	µg/m3	<6.21
TO-15	Bromomethane	ppb	<0.200	µg/m3	<0.776
TO-15	Carbon disulfide	ppb	<0.200	µg/m3	<0.622
TO-15	Carbon tetrachloride	ppb	<0.200	µg/m3	<1.26
TO-15	Chlorobenzene	ppb	<0.200	µg/m3	<0.924
TO-15	Chloroethane	ppb	<0.200	µg/m3	<0.528
TO-15	Chloroform	ppb	<0.200	µg/m3	<0.973
TO-15	Chloromethane	ppb	<b>0.44</b>	µg/m3	<b>0.91</b>
TO-15	Dibromochloromethane	ppb	<0.200	µg/m3	<1.70
TO-15	1,2-Dibromoethane	ppb	<0.200	µg/m3	<1.54
TO-15	1,2-Dichlorobenzene	ppb	<0.200	µg/m3	<1.20
TO-15	1,3-Dichlorobenzene	ppb	<0.200	µg/m3	<1.20
TO-15	1,4-Dichlorobenzene	ppb	<0.200	µg/m3	<1.20
TO-15	1,2-Dichloroethane	ppb	<0.200	µg/m3	<0.810
TO-15	1,1-Dichloroethane	ppb	<0.200	µg/m3	<0.802
TO-15	1,1-Dichloroethene	ppb	<0.200	µg/m3	<0.793
TO-15	cis-1,2-Dichloroethene	ppb	<0.200	µg/m3	<0.793
TO-15	trans-1,2-Dichloroethene	ppb	<0.200	µg/m3	<0.793
TO-15	1,2-Dichloropropane	ppb	<0.200	µg/m3	<0.924
TO-15	cis-1,3-Dichloropropene	ppb	<0.200	µg/m3	<0.908
TO-15	trans-1,3-Dichloropropene	ppb	<0.200	µg/m3	<0.908
TO-15	1,4-Dioxane	ppb	<0.200	µg/m3	<0.721
TO-15	Ethanol	ppb	<b>5.5</b>	µg/m3	<b>10</b>
TO-15	Ethylbenzene	ppb	<0.200	µg/m3	<0.867
TO-15	Trichlorofluoromethane	ppb	<b>0.26</b>	µg/m3	<b>1.5</b>
TO-15	Dichlorodifluoromethane	ppb	<b>0.43</b>	µg/m3	<b>2.1</b>
TO-15	Hexachloro-1,3-butadiene	ppb	<0.630	µg/m3	<6.73
TO-15	n-Hexane	ppb	<b>0.36</b>	µg/m3	<b>1.3</b>
TO-15	Isopropylbenzene	ppb	<0.200	µg/m3	<0.983
TO-15	Methylene Chloride	ppb	<b>0.65</b>	µg/m3	<b>2.3</b>
TO-15	Methyl Butyl Ketone	ppb	<1.25	µg/m3	<5.11
TO-15	2-Butanone (MEK)	ppb	<1.25	µg/m3	<3.69
TO-15	4-Methyl-2-pentanone (MIBK)	ppb	<1.25	µg/m3	<5.12
TO-15	Methyl methacrylate	ppb	<0.200	µg/m3	<0.819
TO-15	MTBE	ppb	<0.200	µg/m3	<0.721
TO-15	Styrene	ppb	<0.200	µg/m3	<0.851
TO-15	1,1,2,2-Tetrachloroethane	ppb	<0.200	µg/m3	<1.37
TO-15	Tetrachloroethylene	ppb	<0.200	µg/m3	<1.36
TO-15	Toluene	ppb	<b>0.31</b>	µg/m3	<b>1.2</b>
TO-15	1,2,4-Trichlorobenzene	ppb	<0.630	µg/m3	<4.66
TO-15	1,1,1-Trichloroethane	ppb	<0.200	µg/m3	<1.09
TO-15	1,1,2-Trichloroethane	ppb	<0.200	µg/m3	<1.09
TO-15	Trichloroethylene	ppb	<0.200	µg/m3	<1.07
TO-15	Vinyl acetate	ppb	<0.200	µg/m3	<0.704
TO-15	Vinyl chloride	ppb	<0.200	µg/m3	<0.511
TO-15	m&p-Xylene	ppb	<b>0.46</b>	µg/m3	<b>2</b>
TO-15	o-Xylene	ppb	<0.200	µg/m3	<0.867
TO-15	1,2,4-Trimethylbenzene	ppb	<0.200	µg/m3	<0.982
TO-15	1,3,5-Trimethylbenzene	ppb	<0.200	µg/m3	<0.982
TO-15	1,4-Bromofluorobenzene	% Rec.	95		95

**Notes**

**Bolded** values indicate target analyte at or above a detectable level.

**TABLE 4**  
**SUB-SLAB SAMPLING RESULTS, VALLEY ASPHALT**

**SUMMARY OF THREE TESTING EVENTS DURING THE FIRST YEAR AFTER INSTALLATION OF SSDS**

Parameter	Units	30-day (8/5/13)	180-day (12/18/13)	1-year (7/7/14)	ODH Screening (ppb)	Units	30-day (8/5/13)	180-day (12/18/13)	1-year (7/7/14)	ODH Screening (µg/m <sup>3</sup> )
		Value	Value	Value			Value	Value	Value	
Acetone	ppb	11	7.4	15	-	µg/m3	26	18	36	-
Allyl chloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.626	<0.626	<0.626	-
Benzene	ppb	<0.200	0.21	0.73	20	µg/m3	<0.639	0.67	2.3	40
Benzyl Chloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.04	<1.04	<1.04	-
Bromodichloromethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.34	<1.34	<1.34	-
Bromoform	ppb	<0.600	<0.600	<0.600	-	µg/m3	<6.21	<6.21	<6.21	-
Bromomethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.776	<0.776	<0.776	-
Carbon disulfide	ppb	<0.200	<0.200	13	-	µg/m3	<0.622	<0.622	40	-
Carbon tetrachloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.26	<1.26	<1.26	-
Chlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.924	<0.924	<0.924	-
Chloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.528	<0.528	<0.528	-
Chloroform	ppb	<0.200	0.21	1.5	800	µg/m3	<0.973	1	7.3	4000
Chloromethane	ppb	0.23	<0.200	<0.200	-	µg/m3	0.48	<0.413	<0.413	-
Dibromochloromethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.70	<1.70	<1.70	-
1,2-Dibromoethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.54	<1.54	<1.54	-
1,2-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
1,3-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
1,4-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
1,2-Dichloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.810	<0.810	<0.810	-
1,1-Dichloroethane	ppb	<0.200	<0.200	<0.200	160	µg/m3	<0.802	<0.802	<0.802	630
1,1-Dichloroethene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.793	<0.793	<0.793	-
cis-1,2-Dichloroethene	ppb	<0.200	0.25	<0.200	370	µg/m3	<0.793	0.99	<0.793	1500
trans-1,2-Dichloroethene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.793	<0.793	<0.793	-
1,2-Dichloropropane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.924	<0.924	<0.924	-
cis-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.908	<0.908	<0.908	-
trans-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.908	<0.908	<0.908	-
1,4-Dioxane	ppb	0.22	<0.200	0.42	-	µg/m3	0.79	<0.721	1.5	-
Ethanol	ppb	130	54	220	-	µg/m3	250	100	410	-
Ethylbenzene	ppb	0.2	<0.200	54	2500	µg/m3	0.87	<0.867	230	13000
Trichlorofluoromethane	ppb	0.28	0.3	0.3	-	µg/m3	1.6	1.7	1.7	-
Dichlorodifluoromethane	ppb	0.47	0.76	0.34	-	µg/m3	2.3	3.8	1.7	-
Hexachloro-1,3-butadiene	ppb	<0.630	<0.630	<0.630	-	µg/m3	<6.73	<6.73	<6.73	-
n-Hexane	ppb	0.81	<0.200	0.23	-	µg/m3	2.9	<0.705	0.81	-
Isopropylbenzene	ppb	<0.200	<0.200	0.93	-	µg/m3	<0.983	<0.983	4.6	-
Methylene Chloride	ppb	1.2	2.6	0.31	-	µg/m3	4.2	9	1.1	-
Methyl Butyl Ketone	ppb	<1.25	<1.25	<1.25	-	µg/m3	<5.11	<5.11	<5.11	-
2-Butanone (MEK)	ppb	1.8	<1.25	3.5	-	µg/m3	5.3	<3.69	10	-
4-Methyl-2-pentanone (MIBK)	ppb	<1.25	<1.25	<1.25	-	µg/m3	<5.12	<5.12	<5.12	-
Methyl methacrylate	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.819	<0.819	<0.819	-
MTBE	ppb	<0.200	<0.200	0.22	-	µg/m3	<0.721	<0.721	0.75	-
Styrene	ppb	<0.200	<0.200	13	-	µg/m3	<0.851	<0.851	55	-
1,1,2,2-Tetrachloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.37	<1.37	<1.37	-
Tetrachloroethylene	ppb	<0.200	0.64	0.21	250	µg/m3	<1.36	4.3	1.4	1700
Toluene	ppb	2.8	0.68	58	-	µg/m3	11	2.6	220	-
1,2,4-Trichlorobenzene	ppb	<0.630	<0.630	<0.630	-	µg/m3	<4.66	<4.66	<4.66	-
1,1,1-Trichloroethane	ppb	<0.200	1.3	<0.200	-	µg/m3	<1.09	7.1	<1.09	-
1,1,2-Trichloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.09	<1.09	<1.09	-
Trichloroethylene	ppb	<0.200	14	1.3	20	µg/m3	<1.07	75	7	100
Vinyl acetate	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.704	<0.704	<0.704	-
Vinyl chloride	ppb	<0.200	<0.200	<0.200	20	µg/m3	<0.511	<0.511	<0.511	40
m&p-Xylene	ppb	0.64	<0.400	40	2000	µg/m3	2.8	<1.73	170	8000
o-Xylene	ppb	0.24	<0.200	13	2000	µg/m3	1	<0.867	56	8000
1,2,4-Trimethylbenzene	ppb	0.26	<0.200	5.2	-	µg/m3	1.3	<0.982	26	-
1,3,5-Trimethylbenzene	ppb	<0.200	<0.200	1.4	-	µg/m3	<0.982	<0.982	6.9	-
1,4-Bromofluorobenzene	% Rec.	100	93	96			100	93	96	

**Notes**

Bolded values indicate target analyte at or above a detectable level.

**TABLE 5**  
**INDOOR AIR SAMPLING RESULTS, VALLEY ASPHALT**

**SUMMARY OF THREE TESTING EVENTS DURING THE FIRST YEAR AFTER INSTALLATION OF SSDS**

Results			30-day (8/5/13)	180-day (12/18/13)	1-Yr (7/7/14)			30-day (8/5/13)	180-day (12/18/13)	1-Yr (7/7/14)	
Method	Parameter	Units	Value	Value	Value	ODH Screening (ppb)	Units	Value	Value	Value	ODH Screening (µg/m3)
TO-15	Acetone	ppb	11	3.5	7.1	-	µg/m3	26	8.3	17	-
TO-15	Allyl chloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.626	<0.626	<0.626	-
TO-15	Benzene	ppb	<0.200	<0.200	<0.200	2	µg/m3	<0.639	<0.639	<0.639	4
TO-15	Benzyl Chloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.04	<1.04	<1.04	-
TO-15	Bromodichloromethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.34	<1.34	<1.34	-
TO-15	Bromoform	ppb	<0.600	<0.600	<0.600	-	µg/m3	<6.21	<6.21	<6.21	-
TO-15	Bromomethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.776	<0.776	<0.776	-
TO-15	Carbon disulfide	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.622	<0.622	<0.622	-
TO-15	Carbon tetrachloride	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.26	<1.26	<1.26	-
TO-15	Chlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.924	<0.924	<0.924	-
TO-15	Chloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.528	<0.528	<0.528	-
TO-15	Chloroform	ppb	<0.200	<0.200	<0.200	80	µg/m3	<0.973	<0.973	<0.973	400
TO-15	Chloromethane	ppb	0.53	0.56	0.54	-	µg/m3	1.1	1.2	1.1	-
TO-15	Dibromochloromethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.70	<1.70	<1.70	-
TO-15	1,2-Dibromoethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.54	<1.54	<1.54	-
TO-15	1,2-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
TO-15	1,3-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
TO-15	1,4-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.20	<1.20	<1.20	-
TO-15	1,2-Dichloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.810	<0.810	<0.810	-
TO-15	1,1-Dichloroethane	ppb	<0.200	<0.200	<0.200	16	µg/m3	<0.802	<0.802	<0.802	63
TO-15	1,1-Dichloroethene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.793	<0.793	<0.793	-
TO-15	cis-1,2-Dichloroethene	ppb	<0.200	<0.200	0.24	37	µg/m3	<0.793	<0.793	0.95	150
TO-15	trans-1,2-Dichloroethene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.793	<0.793	<0.793	-
TO-15	1,2-Dichloropropane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.924	<0.924	<0.924	-
TO-15	cis-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.908	<0.908	<0.908	-
TO-15	trans-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.908	<0.908	<0.908	-
TO-15	1,4-Dioxane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.721	<0.721	<0.721	-
TO-15	Ethanol	ppb	61	330	230	-	µg/m3	120	620	430	-
TO-15	Ethylbenzene	ppb	<0.200	0.3	<0.200	250	µg/m3	<0.867	1.3	<0.867	1300
TO-15	Trichlorofluoromethane	ppb	0.22	0.2	0.27	-	µg/m3	1.2	1.1	1.5	-
TO-15	Dichlorodifluoromethane	ppb	0.45	0.42	0.3	-	µg/m3	2.2	2.1	1.5	-
TO-15	Hexachloro-1,3-butadiene	ppb	<0.630	<0.630	<0.630	-	µg/m3	<6.73	<6.73	<6.73	-
TO-15	n-Hexane	ppb	0.38	0.32	0.38	-	µg/m3	1.3	1.1	1.3	-
TO-15	Isopropylbenzene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.983	<0.983	<0.983	-
TO-15	Methylene Chloride	ppb	0.6	<0.200	0.36	-	µg/m3	2.1	<0.694	1.3	-
TO-15	Methyl Butyl Ketone	ppb	<1.25	<1.25	<1.25	-	µg/m3	<5.11	<5.11	<5.11	-
TO-15	2-Butanone (MEK)	ppb	<1.25	<1.25	<1.25	-	µg/m3	<3.69	<3.69	<3.69	-
TO-15	4-Methyl-2-pentanone (MIBK)	ppb	<1.25	<1.25	<1.25	-	µg/m3	<5.12	<5.12	<5.12	-
TO-15	Methyl methacrylate	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.819	<0.819	<0.819	-
TO-15	MTBE	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.721	<0.721	<0.721	-
TO-15	Styrene	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.851	<0.851	<0.851	-
TO-15	1,1,2,2-Tetrachloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.37	<1.37	<1.37	-
TO-15	Tetrachloroethylene	ppb	<0.200	1.3	<0.200	25	µg/m3	<1.36	8.8	<1.36	170
TO-15	Toluene	ppb	1.4	0.83	0.6	-	µg/m3	5.3	3.1	2.3	-
TO-15	1,2,4-Trichlorobenzene	ppb	<0.630	<0.630	<0.630	-	µg/m3	<4.66	<4.66	<4.66	-
TO-15	1,1,1-Trichloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.09	<1.09	<1.09	-
TO-15	1,1,2-Trichloroethane	ppb	<0.200	<0.200	<0.200	-	µg/m3	<1.09	<1.09	<1.09	-
TO-15	Trichloroethylene	ppb	<0.200	<0.200	1	2	µg/m3	<1.07	<1.07	5.4	10
TO-15	Vinyl acetate	ppb	<0.200	<0.200	<0.200	-	µg/m3	<0.704	<0.704	<0.704	-
TO-15	Vinyl chloride	ppb	<0.200	<0.200	<0.200	2	µg/m3	<0.511	<0.511	<0.511	4
TO-15	m&p-Xylene	ppb	0.53	0.93	0.52	200	µg/m3	2.3	4	2.3	800
TO-15	o-Xylene	ppb	0.2	0.42	0.2	16	µg/m3	0.87	1.8	0.87	63
TO-15	1,2,4-Trimethylbenzene	ppb	0.25	0.83	0.25	-	µg/m3	1.2	4.1	1.2	-
TO-15	1,3,5-Trimethylbenzene	ppb	<0.200	0.24	<0.200	-	µg/m3	<0.982	1.2	<0.982	-
TO-15	1,4-Bromofluorobenzene	% Rec.	100	93	94			100	93	94	

**Notes**

Bolded values indicate target analyte at or above a detectable level.



**TABLE 6**  
**OUTDOOR AIR SAMPLING RESULTS, VALLEY ASPHALT**

**SUMMARY OF THREE TESTING EVENTS DURING THE FIRST YEAR AFTER INSTALLATION OF SSDS**

Results			30-day (8/5/13)	180-day (12/18/13)	1-Yr (7/7/14)		30-day (8/5/13)	180-day (12/18/13)	1-Yr (7/7/14)
Method	Parameter	Units	Value	Value	Value	Units	Value	Value	Value
TO-15	Acetone	ppb	3.4	2.1	7.5	µg/m3	8.1	5	18
TO-15	Allyl chloride	ppb	<0.200	<0.200	<0.200	µg/m3	<0.626	<0.626	<0.626
TO-15	Benzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.639	<0.639	<0.639
TO-15	Benzyl Chloride	ppb	<0.200	<0.200	<0.200	µg/m3	<1.04	<1.04	<1.04
TO-15	Bromodichloromethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.34	<1.34	<1.34
TO-15	Bromoform	ppb	<0.600	<0.600	<0.600	µg/m3	<6.21	<6.21	<6.21
TO-15	Bromomethane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.776	<0.776	<0.776
TO-15	Carbon disulfide	ppb	<0.200	<0.200	<0.200	µg/m3	<0.622	<0.622	<0.622
TO-15	Carbon tetrachloride	ppb	<0.200	<0.200	<0.200	µg/m3	<1.26	<1.26	<1.26
TO-15	Chlorobenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.924	<0.924	<0.924
TO-15	Chloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.528	<0.528	<0.528
TO-15	Chloroform	ppb	<0.200	<0.200	<0.200	µg/m3	<0.973	<0.973	<0.973
TO-15	Chloromethane	ppb	0.42	0.56	0.44	µg/m3	0.87	1.2	0.91
TO-15	Dibromochloromethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.70	<1.70	<1.70
TO-15	1,2-Dibromoethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.54	<1.54	<1.54
TO-15	1,2-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<1.20	<1.20	<1.20
TO-15	1,3-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<1.20	<1.20	<1.20
TO-15	1,4-Dichlorobenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<1.20	<1.20	<1.20
TO-15	1,2-Dichloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.810	<0.810	<0.810
TO-15	1,1-Dichloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.802	<0.802	<0.802
TO-15	1,1-Dichloroethene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.793	<0.793	<0.793
TO-15	cis-1,2-Dichloroethene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.793	<0.793	<0.793
TO-15	trans-1,2-Dichloroethene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.793	<0.793	<0.793
TO-15	1,2-Dichloropropane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.924	<0.924	<0.924
TO-15	cis-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.908	<0.908	<0.908
TO-15	trans-1,3-Dichloropropene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.908	<0.908	<0.908
TO-15	1,4-Dioxane	ppb	<0.200	<0.200	<0.200	µg/m3	<0.721	<0.721	<0.721
TO-15	Ethanol	ppb	3.2	5	5.5	µg/m3	6	9.4	10
TO-15	Ethylbenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.867	<0.867	<0.867
TO-15	Trichlorofluoromethane	ppb	<0.200	0.2	0.26	µg/m3	<1.12	1.1	1.5
TO-15	Dichlorodifluoromethane	ppb	0.36	0.45	0.43	µg/m3	1.8	2.2	2.1
TO-15	Hexachloro-1,3-butadiene	ppb	<0.630	<0.630	<0.630	µg/m3	<6.73	<6.73	<6.73
TO-15	n-Hexane	ppb	<0.200	<0.200	0.36	µg/m3	<0.705	<0.705	1.3
TO-15	Isopropylbenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.983	<0.983	<0.983
TO-15	Methylene Chloride	ppb	<0.200	<0.200	0.65	µg/m3	<0.694	<0.694	2.3
TO-15	Methyl Butyl Ketone	ppb	<1.25	<1.25	<1.25	µg/m3	<5.11	<5.11	<5.11
TO-15	2-Butanone (MEK)	ppb	<1.25	<1.25	<1.25	µg/m3	<3.69	<3.69	<3.69
TO-15	4-Methyl-2-pentanone (MIBK)	ppb	<1.25	<1.25	<1.25	µg/m3	<5.12	<5.12	<5.12
TO-15	Methyl methacrylate	ppb	<0.200	<0.200	<0.200	µg/m3	<0.819	<0.819	<0.819
TO-15	MTBE	ppb	<0.200	<0.200	<0.200	µg/m3	<0.721	<0.721	<0.721
TO-15	Styrene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.851	<0.851	<0.851
TO-15	1,1,2,2-Tetrachloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.37	<1.37	<1.37
TO-15	Tetrachloroethylene	ppb	<0.200	<0.200	<0.200	µg/m3	<1.36	<1.36	<1.36
TO-15	Toluene	ppb	0.22	<0.20	0.31	µg/m3	0.83	<0.75	1.2
TO-15	1,2,4-Trichlorobenzene	ppb	<0.630	<0.630	<0.630	µg/m3	<4.66	<4.66	<4.66
TO-15	1,1,1-Trichloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.09	<1.09	<1.09
TO-15	1,1,2-Trichloroethane	ppb	<0.200	<0.200	<0.200	µg/m3	<1.09	<1.09	<1.09
TO-15	Trichloroethylene	ppb	<0.200	<0.200	<0.200	µg/m3	<1.07	<1.07	<1.07
TO-15	Vinyl acetate	ppb	<0.200	<0.200	<0.200	µg/m3	<0.704	<0.704	<0.704
TO-15	Vinyl chloride	ppb	<0.200	<0.200	<0.200	µg/m3	<0.511	<0.511	<0.511
TO-15	m&p-Xylene	ppb	<0.400	<0.400	0.46	µg/m3	<1.73	<1.73	2
TO-15	o-Xylene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.867	<0.867	<0.867
TO-15	1,2,4-Trimethylbenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.982	<0.982	<0.982
TO-15	1,3,5-Trimethylbenzene	ppb	<0.200	<0.200	<0.200	µg/m3	<0.982	<0.982	<0.982
TO-15	1,4-Bromofluorobenzene	% Rec.	100	92	95		100	92	95

**Notes**

**Bolded** values indicate target analyte at or above a detectable level.



# OHIO DEPARTMENT OF HEALTH

246 North High Street  
Columbus, Ohio 43215

614/466-3543  
[www.odh.ohio.gov](http://www.odh.ohio.gov)

John R. Kasich / Governor

Theodore E. Wymyslo, M.D. / Director of Health

June 20, 2012

Steven Renninger, On-Scene Coordinator  
U.S. Environmental Protection Agency  
Emergency Response Branch  
26 West Martin Luther King Drive (G41)  
Cincinnati, OH 45268

Dear Steve:

Per your request, ODH HAS is providing screening levels for the contaminants of concern in indoor air and sub-slab soil gas for properties at South Dayton Dump in Dayton, Ohio.

The values listed in the tables are expressed in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and parts per billion (ppb). We prefer the use of ppb, as we believe it is more easily understood by the general public. Based on the Region 5 guidance, we are giving you both screening levels and action levels for assessing vapor intrusion sites:

**Screening Levels** are based on  $10^{-5}$  cancer risk or hazard index of 1.0. Screening levels represent concentrations of a substance that are unlikely to cause harmful (adverse) health effects in exposed people. Detections in indoor air below these levels are not of a health concern. When available, our screening levels were taken from ATSDR's minimal risk levels (MRLs) and cancer risk evaluation guides (CREGs). Other sources include the U.S. EPA's reference concentrations (RfCs), regional screening levels (RSLs); and, in the case of cis-1,2-DCE, the 2002 OSWER Vapor Intrusion Guidance.

**Action Levels** are based on  $10^{-4}$  cancer risk and hazard index of 10. Detections in indoor air that exceed this level would lead to a recommendation for actions to reduce exposure in a relatively short period of time. Detections below the action level, but above the screening level would be referred to the EPA Remedial program or to the state for evaluation.

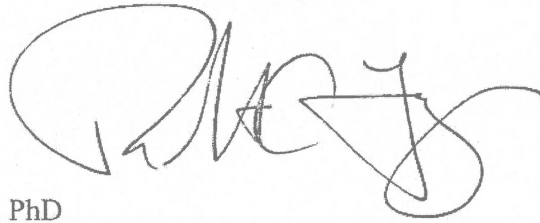
Also included are corresponding values for non-residential buildings – spaces that are not used for residences or where children are not continuously present. Non-residential buildings include commercial businesses and public buildings, churches, non-manufacturing businesses, and industries where these chemicals are not used as part of the manufacturing process. The non-residential screening levels were derived by adjusting the residential values by a factor of 4.2 to adjust from a 168-hour week for the residential exposure to a 40-hour work week for the non-residential exposure.

For industrial settings where the chemicals in question are used, OSHA permissible exposure limits or other occupational exposure values would apply.

If you have any questions regarding these values, please contact John Kollman in my program at (614) 752-8335.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read 'RF', with a large, stylized loop at the end.

Robert Frey, PhD

Chief, Health Assessment Section, Ohio Department of Health

RF/jk

**Table 1. Screening Levels – South Dayton Dump**

Chemical of Concern	Residential		Source/Criteria	Non-residential		Source/Criteria
	$\mu\text{g}/\text{m}^3$	ppb		$\mu\text{g}/\text{m}^3$	ppb	
Indoor Air Screening Levels						
1,1-Dichloroethane	15	3.7	EPA RSL/C/ $10^{-5}$	63	16	EPA RSL/C/ $10^{-5}$ x 4.2
Benzene	1	0.4	CREG/C/ $10^{-5}$	4	2	CREG/C/ $10^{-5}$ x 4.2
Chloroform	100	20	ATSDR/NC	400	80	ATSDR/NC
cis-1,2-Dichloroethylene	35	8.8	OSWER/NC	150	37	OSWER/NC x 4.2
Ethylbenzene	300	60	ATSDR/NC	1,300	250	ATSDR/NC x 4.2
Tetrachloroethylene (PCE)	40	6	EPA RfC	170	25	EPA RfC x 4.2
Trichloroethylene (TCE)	2	0.4	EPA RfC	10	2	EPA RfC x 4.2
m,p-Xylene*	200	50	ATSDR/NC	800	200	ATSDR/NC x 4.2
o-Xylene*	200	50	ATSDR/NC	63	16	ATSDR/NC x 4.2
Vinyl chloride	1	0.4	CREG/C/ $10^{-5}$	4	2	CREG/C/ $10^{-5}$ x 4.2
Sub-slab Soil Gas Screening Levels						
1,1-Dichloroethane	150	37	EPA RSL/C/ $10^{-5}$ x 10	630	160	EPA RSL/C/ $10^{-5}$ x 10 x 4.2
Benzene	10	4	CREG/C/ $10^{-5}$ x 10	40	20	CREG/C/ $10^{-5}$ x 10 x 4.2
Chloroform	1,000	200	ATSDR/NC x10	4,000	800	ATSDR/NC x10 x 4.2
cis-1,2-Dichloroethylene	350	88	OSWER/NC x 10	1,500	370	OSWER/NC x 10 x 4.2
Ethylbenzene	3,000	600	ATSDR/NC x10	13,000	2,500	ATSDR/NC x10 x 4.2
Tetrachloroethylene (PCE)	400	60	EPA RfC x 10	1,700	250	EPA RfC x 10 x 4.2
Trichloroethylene (TCE)	20	4	EPA RfC x 10	100	20	EPA RfC x 10 x 4.2
m,p-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
o-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
Vinyl chloride	10	4	CREG/C/ $10^{-5}$ x 10	40	20	CREG/C/ $10^{-5}$ x 10 x 4.2

\*ATSDR comparison value for total xylenes  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 ppb = parts per billion  
 C = cancer  
 NC = noncancer

$10^{-5}$  = cancer risk of 1 in 100,000  
 CREG = cancer risk evaluation guide (ATSDR)\  
 RfC = EPA Reference Concentration  
 RSL = Regional Screening Level (EPA April 2012)



**Table 2. Action Levels – South Dayton Dump**

Chemical of Concern	Residential		Source/Criteria	Non-residential		Source/Criteria
	$\mu\text{g}/\text{m}^3$	ppb		$\mu\text{g}/\text{m}^3$	ppb	
Indoor Air Action Levels						
1,1-Dichloroethane	150	37	EPA RSL/C/ $10^{-4}$	630	160	EPA RSL/C/ $10^{-4}$ x 4.2
Benzene	10	4	CREG/C/ $10^{-4}$	40	20	CREG/C/ $10^{-4}$ x 4.2
Chloroform	1,000	200	ATSDR/NC x 10	4,000	800	ATSDR/NC x 10 x 4.2
cis-1,2-Dichloroethylene	350	88	OSWER/NC x 10	1,500	370	OSWER/NC x 10 x 4.2
Ethylbenzene	3,000	600	ATSDR/NC x 10	13,000	2,500	ATSDR/NC x 10 x 4.2
Tetrachloroethylene (PCE)	400	60	EPA RfC/NC x 10	1,700	250	EPA RfC/NC x 10 x 4.2
Trichloroethylene (TCE)	20	4	EPA RfC/NC x 10	100	20	EPA RfC/NC x 10 4.2
m,p-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
o-Xylene*	2,000	500	ATSDR/NC x 10	630	160	ATSDR/NC x 10 x 4.2
Vinyl chloride	10	4	CREG/C/ $10^{-4}$	40	20	CREG/C/ $10^{-4}$ x 4.2
Sub-slab Soil Gas Action Levels						
1,1-Dichloroethane	1,500	370	EPA RSL/C/ $10^{-4}$ x 10	6,300	1,600	EPA RSL/C/ $10^{-4}$ x 10 x 4.2
Benzene	100	40	CREG/C/ $10^{-4}$ x 10	400	200	CREG/C/ $10^{-4}$ x 10 x 4.2
Chloroform	10,000	2,000	ATSDR/NC x 100	40,000	8,000	ATSDR/NC x 100 x 4.2
cis-1,2-Dichloroethylene	3,500	880	OSWER/NC x 100	15,000	3,700	OSWER/NC x 100 x 4.2
Ethylbenzene	30,000	6,000	ATSDR/NC x100	130,000	25,000	ATSDR/NC x100 x 4.2
Tetrachloroethylene (PCE)	4,000	600	EPA RfC/NC x 100	17,000	2,500	EPA RfC/NC x 100 x 4.2
Trichloroethylene (TCE)	200	40	EPA RfC/NC x 100	1,000	200	EPA RfC/NC x 100 x 4.2
m,p-Xylene*	20,000	5,000	ATSDR/NC x 100	80,000	20,000	ATSDR/NC x 100 x 4.2
o-Xylene*	20,000	5,000	ATSDR/NC x 100	80,000	20,000	ATSDR/NC x 100 x 4.2
Vinyl chloride	100	40	CREG/C/ $10^{-4}$ x 10	400	200	CREG/C/ $10^{-4}$ x 10 x 4.2

\*ATSDR comparison value for total xylenes  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 ppb = parts per billion  
 C = cancer  
 NC = noncancer

$10^{-4}$  = cancer risk of 1 in 10,000  
 CREG = cancer risk evaluation guide (ATSDR)  
 RfC = EPA Reference Concentration  
 RSL = Regional Screening Level (EPA April 2012)